

TITLE: Taxonomy and Distribution of harmful algal species

MILESTONE SHC 2.5.2: Provide forecast on the occurrence, distribution, and frequency of a harmful algal bloom in the U.S. and develop capability to provide future forecasts.

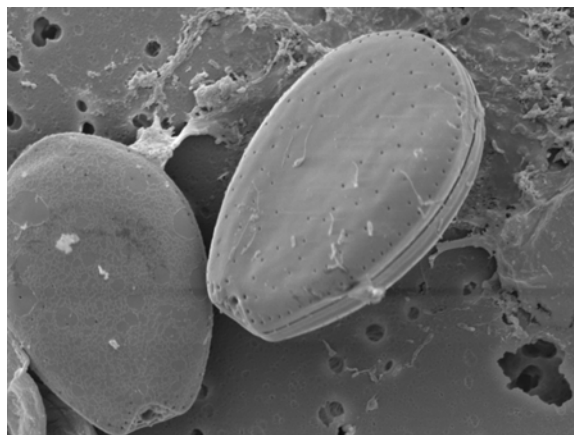
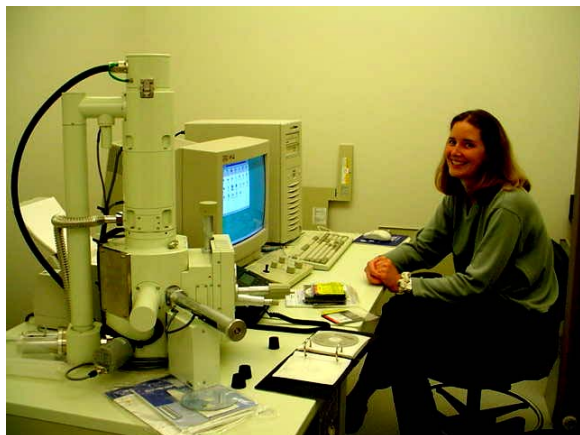
CCEHBR SCIENTISTS/INVESTIGATORS: Steve Morton (PI), Laurinda Smith, Kate Schaeffer, Christine Mikulski, Tod Leighfield

EXTERNAL COLLABORATORS: North Carolina State University, Florida Fish and Wildlife Conservation Commission, University of Rhode Island, Florida Institute of Technology, South Carolina Department of Natural Resources, Smithsonian Institution National Museum of Natural History, Maine Department of Marine Resources

OBJECTIVES OF RESEARCH ACTIVITIES: Identify and describe new species of HAB species occurring in coastal waters of various states to provide a scientifically sound foundation for the detection and monitoring of these species.

DESCRIPTION OF RESEARCH ACTIVITIES: In recent years, harmful algal blooms (HABs) have been of growing concern in the coastal waters of many parts of the world. These bloom events can, at times, cause water discoloration and impact commercial and recreational interests in the affected region. When associated with harmful events, species identification of these organisms is critically important. The list of dinoflagellates and other algae causing harmful blooms and those capable of producing bioactive compounds is incomplete and continues to grow. This research describes new species of potential harmful algae and determines the distribution of known toxic species. Data from this research provides scientifically sound foundation for the detection and monitoring of these species.

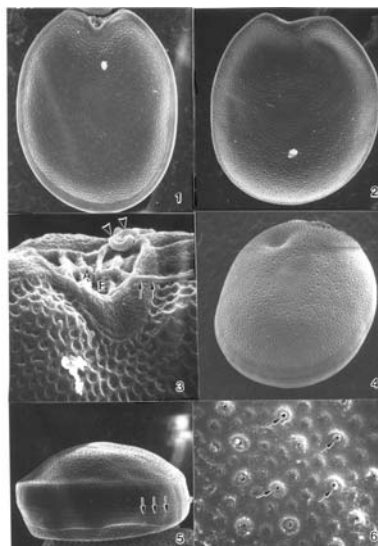
GRAPHIC/IMAGE/FIGURES



Scanning electron microscopy (left) is a critical tool in the identification of algae. Research by the Marine Biotoxins Program has extended the range of *Prorocentrum lima* (right), a dinoflagellate that produces okadaic acid, to South Carolina, Argentina, and the Russian Black Sea Coast.

Selected Highlights

A new species of dinoflagellate was recently described by the Marine Biotoxins Program in collaboration with the Smithsonian Institution Museum of Natural History. This species, named *Prorocentrum arabianum* Morton et Faust formed blooms in the Gulf of Oman and was associated with fish kills. A culture of this new species was found to produce both a polar and a non-polar bioactive compound(s). Further studies are ongoing to determine the chemical structure and mode of action of these bioactive compounds.



Publications/Reports:

Villareal, T.A. and S.L. Morton. 2002. Use of cell-specific PAM-fluorometry to characterize host shading in the epiphytic dinoflagellate *Gambierdiscus toxicus*. *Journal of Marine Ecology* 23(2): 127-140.

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Lewitus, A.J, K.C. Hayes, S.G. Gransden, H.B. Glasgow Jr, J.B. Burkholder, P.M. Gilbert, and S.L. Morton. 2002. Ecological characterization of a widespread red tide in South Carolina estuaries: a newly observed phenomenon. *Harmful Algal Blooms 2000* (Hallegraeff, G.M. S.I. Blackburn, C.J. Bolch, and R.J. Lewis, eds) pp. 129-132.

Morton, S.L., M.A. Faust, E.A. Faurey and P.D.R. Moeller. In Press. Morphology and toxicology of *Prorocentrum arabanum* sp. nov. (Dinophyceae), a toxic marine dinoflagellate from the Arabian Sea. *Journal of Harmful Algae*.

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